

Unfortunately I do not know of any specimens of *Testudo Phayrei* (the type of *Scapia*) being in Europe, and I have never had the opportunity of examining any; but as it appears that all the specimens that have been examined have a flat sternum, probably this species has the sternum flat in both sexes, as is the case in many land-tortoises, and the concavity of the sternum in males of *Manouria* would be a peculiarity of that genus.

Until the skull on which *Scapia* was founded was determined to be the skull of *Testudo Phayrei*, it was not known that the animal was so like that of *Manouria*; but since that time the two genera have been arranged in a special section (see Appendix to Catal. Shield Reptiles, 1872, p. 7). The animals of both resemble that of *Testudo sulcata* of Africa in form and in the scales on the legs and thighs; but that has only a single caudal plate and a shorter head.

XXXIV.—On *Trionyx gangeticus*, Cuvier, *Trionyx hurum*, B.H. and Dr. Gray. By Dr. ANDERSON, Calcutta.

DR. GRAY'S characteristic reply\* to my strictures† on his understanding of the two species of Gangetic mud-tortoises seems to indicate that his present knowledge of these species, instead of being an advance on his 'Synopsis Reptilium,' is a relapse into confusion and unreliability. It is not surprising, therefore, that Dr. Gray and his friend conjointly were unable to follow the drift of my remarks. But, although I may not carry conviction to Dr. Gray's mind, I hope to be able, in the following observations, to prove satisfactorily to unprejudiced minds that the skull figured by Cuvier under the name of *Trionyx gangeticus*, and referred by Dr. Gray to the *Trionyx hurum*‡ of Buchanan Hamilton, described at p. 47 in the 'Synopsis Reptilium,' redescribed in the 'Catalogue of Shield Reptiles,' p. 66, under the name of *Trionyx gangeticus*, Cuvier, and again brought forward under the same name at

\* Ann. & Mag. Nat. Hist. ser. 4. no. 54, p. 473. † *Ibid.* no. 53, p. 382.

‡ Dr. Gray, in his 'Synopsis Reptilium,' under the name of *T. hurum*, announces the brilliant discovery that "Cuvier's specimen appears to have a peculiarity, in the web between the second and third fingers of each foot being pierced with a hole;" and he further observes that these remarkable solutions of continuity "are not noticed in any of Dr. Hamilton's or General Hardwicke's figures from living animals." These holes, which evidently suggest to Dr. Gray's mind a wide and interesting field for further research, are made by the fishermen, who pass a cord through them and tie the feet together to prevent the animals escaping!

p. 97 in the Supplement to the latter work, is not the skull of that species.

The confusion that exists in Dr. Gray's Catalogues regarding the foregoing species (*T. hurum*) and his so-called *Trionyx javanicus*, Schweigger, MS., 'Illustrations of Indian Zoology,' (*T. javanicus*, Geoff.) 'Synopsis Reptilium,' p. 48, and 'Cat. Shield Rept.' p. 67, and *Potamochelys stellata*, Geoff., 'Suppl. Cat. Shield Rept.' p. 104, is alone explicable on the justifiable supposition that Dr. Gray is more anxious to catalogue the specimens under his charge than to work out their natural affinities by a careful consideration of the characters of the materials at his disposal. It would be well if Dr. Gray would carefully ponder the admirable advice which was so ably tendered to him by M. Brunner de Wattenwyl\*, and remember that "les espèces sont des entités de la nature dont l'observation est du domaine de la philosophie."

The pernicious practice of creating new genera on characters derived exclusively from single skulls or from drawings of skulls without any knowledge whatever of the animals that yielded them, has resulted in this, that we find animals described by Dr. Gray in his Catalogues with their skulls and tails allocated in widely apart genera. The confused maze of synonyms which this practice has elaborated can be better imagined than described.

The facts connected with the two Gangetic mud-tortoises are these:—Dr. Gray's figure in the 'Illustrations of Indian Zoology,' bearing the name *Trionyx javanicus*, Schweigger, MS., represents the most prevalent species. Its skull is identical with the skull figured by Dr. Gray at pl. xlii. fig. 1 of his 'Catalogue of Shield Reptiles,' and which is there correctly named *Trionyx gangeticus*. This skull, however, is referred by Dr. Gray to the other species of Gangetic mud-tortoises, which was originally described by him in his 'Synopsis Reptilium,' p. 47, under the name *Trionyx hurum*, but which in his 'Suppl. to the Cat. of Shield Rept.' p. 97, is reproduced as *T. gangeticus*, Cuvier. This species (*T. hurum*), however, does not yield a skull like the skull figured by Cuvier as *T. gangeticus*; but if Dr. Gray will turn to pl. xlii. fig. 2 of his 'Cat. of Shield Rept.' he will find a skull figured, but without a name, which is very closely allied to the skull of *T. hurum*. The differences that exist between the skulls there figured indicate those that exist between *Trionyx gangeticus* and *Trionyx hurum*. But, although it is impossible to separate generically the skulls figured on that plate, Dr. Gray makes the unguarded statement that the two mud-tortoises of the Ganges, in question,

\* Rev. et Mag. de Zoologie, Mars 1870.

belong to two genera. It should be borne in mind, however, that Dr. Gray has no practical acquaintance with the skull of his *T. javanicus*, Geoff., which is the last name but one which he has adopted for the *Testudo gotaghol* of Buchanan Hamilton, and which he named in the 'Illustrations of Indian Zoology' *Trionyx javanicus*, Schweigger, although he now states that Schweigger "never uses such a name." In the 'Synopsis Reptilium,' p. 48, and in the 'Catalogue of Shield Reptiles,' p. 67, the same species appears under the name *T. javanicus*, Geoff.; but Dr. Gray's knowledge of the species had apparently undergone a change in the interval between the publication of the Catalogue and its Supplement, because in the latter (p. 104) the species is brought on the stage as *Potamochelys stellata*, Geoff.

Dr. Gray remarks of the skull of *Emyda punctata* (Suppl. Cat. Sh. Rept. p. 117) that it is very like that of *Potamochelys*. I have before me a skull which I removed with my own hands from an adult specimen of the common yellow-spotted *Emyda* of the Ganges. This skull, although it is larger than Dr. Gray's figure of *Potamochelys stellata*, Geoff., I am prepared to prove is generically identical with the skull which that figure represents; in other words, Dr. Gray's figure of the skull of *Potamochelys stellata*, Geoff., is the skull of an *Emyda* closely allied to *Emyda punctata*.

It is to be desired that Dr. Gray should state whence he obtained the figure of the skull of his so-called *Potamochelys stellata*, Geoff., because in writing of the species he distinctly states, "I have not been able to examine any skulls of it." Has Dr. Gray copied the skull from Prof. Wagler's figure without any acknowledgment, and without any grounds that justified him in referring the skull of an *Emyda* to the body of a true *Trionyx*, the skull of which had been already figured and described by Cuvier as *Trionyx gangeticus*?

The foregoing insight into the character of the 'Supplement to the Catalogue of Shield Reptiles in the Collection of the British Museum' is unfortunately not an isolated instance of the many inaccuracies which distinguish it. Only a very short time ago I pointed out that Dr. Gray's genera *Manouria* and *Scapia* refer to one animal, the shell constituting the former and the skull the latter genus, the two genera being the equivalent of the genus *Testudo*\*! The correctness of what

\* A paper of mine appeared in this Journal, vol. viii. p. 324 (1871), under the misnomer, "On *Testudo Phayrei*, Theob. and Dr. Gray," whereas it should have been "On *Trionyx Phayrei*" &c. The whole internal evidence of the paper proved the absurdity of the title, which I believe was drawn out by the editors of the 'Annals.' [Whatever Dr. Anderson

I then stated has been allowed by Dr. Gray, as he has returned the skull of *Scapia Falconeri* to this museum on the strength of my representation.

Before concluding, I may observe that I have never asked Dr. Gray, on any occasion, for his opinion of Dr. Fleming, and that I never had the privilege, while a student, to be a regular member of Dr. Fleming's class; and under these circumstances I object to Dr. Gray's Chelonian method being applied to me.

PROCEEDINGS OF LEARNED SOCIETIES.

ROYAL SOCIETY.

May 30, 1872.—George Biddell Airy, C.B., President,  
in the Chair.

“On the Structure and Development of the Skull of the Salmon (*Salmo salar*, L.)”\* By WILLIAM KITCHEN PARKER, F.R.S.

A few years ago Mr. Waterhouse Hawkins put into my hands some newly hatched salmon and also three of the first summer. Seeing their fitness for embryological research and the interest attaching to the formation of an osseous fish, I applied to my friends Messrs. Frank Buckland and Henry Lee, and these gentlemen most liberally supplied me with a large number of unhatched embryos and of the “fry” of this large fish.

My last subject, the frog, being fairly out of hand, I set myself last summer to this newer and more easy task,—more easy by far; for the translucency of the young salmon contrasts most favourably with the obscurity of the embryo frog.

I found that the two types at the time of hatching did not start fairly, but that the salmon had hastened to finish its *fourth stage* before emerging from the egg; this, however, is partly in consequence of the difference of the envelope in which the embryos are contained; for in the salmon this is a leathery “chorion,” and in the frog a mere gelatinous bleb.

Moreover it soon became apparent that these two “Ichthyopsidans” are in no wise near akin to each other. In the very first stage, where there is an essential agreement, in one important particular they greatly disagree; for the embryo of the salmon has two arches in front of its mouth, while the tadpole has but one; there is also an additional gill-arch in the osseous fish.

In the earliest stage of the salmon worked out by me I found a

may believe, and however absurd the Title, we can assure him it stands in his own hand-writing—at the head of the MS. The only alteration, fortunately, which I ventured to make was the substitution of a *P* for *p* in *Phayrei*.—W.F.]

\* Being an abstract of the Bakerian Lecture.